

## ABSTRACT

Systems and methods for measuring the flow of a liquid along a conduit are disclosed.

A heat source applies thermal energy to a portion of a liquid flowing along a conduit thereby elevating its temperature. A light source generates a first beam that passes through the liquid in the conduit downstream from the position of application of the thermal energy and an optical detector receives this beam in combination with a second beam that is not passed through the liquid in the conduit and measures a change in intensity of a combined beam. The time required for the heated portion of the liquid to move from the point of application of thermal energy to the point at which the beam passes through the liquid is measured. This measured time, along with the distance of separation of the heat source and the optical sensing means permits calculation of the velocity of the liquid in the conduit.